

# ES&H manual

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## Environment, Safety, and Health

### Volume III

#### Part 31: Discharge to Air

## 31.2 Permitting Air Emission Systems

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## 31.2

## Permitting Air Emission Systems\*

## Contents

1.0	Introduction .....	1
2.0	Background on Legislative, Regulatory, and LLNL Policy .....	1
2.1	Federal and State Clean Air Acts .....	1
2.2	Pollutant Categories.....	2
2.3	Jurisdiction of Air Districts.....	2
2.4	Nonattainment Status.....	2
2.5	LLNL Air Management Plan for "No Net Increase" Requirements .....	3
3.0	Organizations and Responsibilities.....	3
3.1	External Organizations.....	3
3.2	LLNL's Internal Organization.....	4
4.0	Air Emission Source Evaluation .....	5
4.1	Which Air Emission Sources Require a Permit?.....	5
4.2	How to Begin the Permit Process.....	5
4.3	Abatement Devices .....	7
5.0	The Permit and Exemption Process.....	7
5.1	How Is an Air Permit Issued? .....	7
5.2	How Much Time Will It Take To Obtain a Permit? .....	8
5.3	Operating Restrictions after a Permit Is Obtained .....	8
5.4	Permit Renewal Process .....	9
5.5	Permit Exemption .....	10
6.0	Special Emission Programs.....	11
6.1	National Emission Standards for Hazardous Air Pollutants (NESHAPS) .....	11
6.2	AB 2588.....	11
6.3	Health Risk Screening.....	12
6.4	Enforcement Programs.....	12
6.5	What Does an Inspector Look For? .....	12
6.6	What Happens if the Inspector Finds a Violation? .....	12
7.0	Who To Contact.....	13
8.0	Work Standards.....	13
	Appendix A Glossary .....	15

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\* Minor revision

## Tables

Table 1.	Examples of air emission sources and chemicals that may require an air permit.....	6
Table 2.	Classes of sources that may be exempt from permitting by the BAAQMD.....	10

## Figure

Figure 1.	Timeline for average permit issuance.....	9
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## 31.2

### Permitting Air Emission Systems

## 1.0 Introduction

The impact of air pollution on public health and the environment is substantial and has resulted in regulations at federal, state, and local government agencies. In California, sources of air pollution are regulated through a system of permits and operating requirements. Permits are required for:

- New equipment or operations that may cause air pollution.
- Modifications to equipment that may increase existing air pollutants or release new ones.

All activities at Lawrence Livermore National Laboratory (LLNL) shall be evaluated to determine the need for air permits and shall operate in full compliance with all applicable requirements of local, state, and federal regulatory agencies. This document provides the information necessary to operate air emission sources at LLNL in full compliance with regulations.

## 2.0 Background on Legislative, Regulatory, and LLNL Policy

### 2.1 Federal and State Clean Air Acts

The air permitting process is driven, in part, by the Federal Clean Air Act and its amendments and California Clean Air Act and its amendments. The Federal Clean Air Act requires each state to develop a State Implementation Plan (SIP) that defines a strategy to attain National Ambient Air Quality Standards (NAAQS). Although SIPs are developed by the state, they must be approved by the U.S. Environmental Protection Agency (EPA). California has an approved implementation plan that delegates responsibility for attaining NAAQS from the California Air Resources Board (CARB) to the Regional Air Pollution Control (alternatively, Air Quality Management) Districts. Air quality standards enforced by the air districts are established to protect the health of the most sensitive portion of the population, such as children, elderly, and those with allergies, asthma, emphysema, or compromised immune systems.

The California Clean Air Act was passed in 1988 and amended in 1990. In general, both the California Clean Air Act and the California Ambient Air Quality Standards are more restrictive than their federal counterparts.

## 2.2 Pollutant Categories

Several pollutants released to the atmosphere are of a major environmental concern, including seven criteria pollutants: sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), ozone, PM<sub>10</sub> (particulate matter of respirable size), PM<sub>2.5</sub>, carbon monoxide (CO), and lead. The level of criteria air pollutants is used as an indicator of ambient air quality.

Volatile organic compounds are of particular concern to the air districts and are divided into two categories: precursor organic compounds (POCs) and nonprecursor organic compounds (NPOCs). The POCs are so named because they are chemical precursors that react with nitrogen oxides at ground level in the presence of sunlight to form photochemical "smog," of which ozone is a primary constituent. For this reason, air districts are particularly interested in reducing POCs and NO<sub>x</sub>. The NPOCs include methylene chloride, 1,1,1-trichloroethane, and the family of chemicals referred to as freons. Freons are subject to regulation because they are believed to deplete ozone in the stratosphere.

Some organic compounds classified as toxic air contaminants are subject to special and highly restrictive regulations. The Bay Area Air Quality Management District (BAAQMD) and San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) add chemicals to this list as they are reviewed. Contact your air permits specialist in the Environmental Protection Department (EPD) for a current list.

## 2.3 Jurisdiction of Air Districts

The main site of LLNL is in the jurisdiction of the BAAQMD; Site 300 is in the jurisdiction of the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD). The regulations of these two air districts are similar, but differences in specific provisions do exist.

## 2.4 Nonattainment Status

Both the Federal and State Clean Air Acts require ambient air quality standards to be established, but California standards are more restrictive than federal standards. Local air districts in California are required to regulate emissions to reduce ambient levels of pollutants and to ensure that the federal and California Ambient Air Quality Standards are not violated.

The current California standard for one hour ozone is 0.09 parts per million (ppm), whereas the federal standard is one-third greater at 0.12 ppm. Some California air districts, including the two in which LLNL's sites are located, are not in compliance with the federal ozone standard and are referred to as nonattainment areas. The BAAQMD is also in nonattainment for carbon monoxide, which has a California

standard of 9.0 ppm. SJVUAPCD is in nonattainment for PM<sub>10</sub>. Many other California air districts are also in nonattainment for these same pollutants.

The California Clean Air Act requires nonattainment areas to reduce their emissions by 5% per year retroactive to the base year, 1987. The Federal Clean Air Act only requires a 3% reduction per year retroactive to the base year, 1990. Each air district is required to submit a Clean Air Plan to the state Air Resources Board that will identify new measures to be implemented to achieve the mandated reductions in air pollution. As part of this process, both the BAAQMD and SJVUAPCD have adopted "no net increase" provisions as part of their plans.

## **2.5 LLNL Air Management Plan for "No Net Increase" Requirements**

The "no net increase" programs are designed to reduce the level of current emissions of POCs and NO<sub>x</sub>. Offsets are mandatory reductions in emissions that are required to counterbalance the emissions from new or modified sources.

The air districts maintain their own Small Facility Bank, which may be used to provide credits to medium-sized facilities, such as LLNL. (LLNL emits less than 50 tons per year of POC or NO<sub>x</sub>, thus qualifying under BAAQMD regulations to receive offsets from the Small Facility Bank.) There are conditions on the use of the bank, such as a requirement for Best Available Retrofit Control Technology on other air emission sources at the facility, and compliance with all permit conditions.

# **3.0 Organizations and Responsibilities**

All workers and organizations shall refer to Document 2.1, "Laboratory and ES&H Policies, General Worker Responsibilities, and Integrated Safety Management" in the *ES&H Manual* for a list of general responsibilities. This section describes specific responsibilities of LLNL organizations and workers who have key safety roles.

## **3.1 External Organizations**

Regulation of air pollution in California involves federal, state, and local agencies. At the federal level, the EPA is responsible for promulgating nationwide standards and for oversight and approval of the air quality planning and regulatory implementation conducted by the state and local air districts. At the state level, CARB is responsible for preparing the SIP with proposals from the local air districts, adopting state ambient air quality standards, and regulating vehicular sources of air pollution. The jurisdiction of CARB encompasses oversight responsibilities for the local air district, including the

authority to take over the operations of a district. CARB conducts fiscal and enforcement audits of district programs and contributes to district funding.

Local air districts are responsible for region-wide planning and permitting and are most often the agencies that pursue enforcement actions against specific facilities. Air districts are analogous to school districts, fire districts, or recreation districts and have similar governing bodies. Air districts may be single-county or unified districts containing parts of two or more counties. Some counties are divided into two air districts based on air basins, that is, geographic areas with common air sheds.

### 3.2 LLNL's Internal Organization

***Environmental Protection Department.*** EPD provides resources to support the air emission control needs of LLNL authorizing organizations through the Operations and Regulatory Affairs Division (ORAD). EPD is responsible for paying permit fees assessed by the air district.

- *ES&H Team Environmental Analyst.* Each LLNL Environment, Safety, and Health (ES&H) Team has an environmental analyst from the Environmental Operations Group (EOG) within ORAD. These environmental analysts help the Responsible Individual and the air permits specialists locate and identify potential sources of air emissions. They periodically check permitted equipment to ensure that authorizing organization personnel understand regulatory and recordkeeping requirements. Environmental analysts are familiar with the more common air emission sources within various authorizing organizations and shall be made aware of new or modified operations that are sources of air emissions by the Responsible Individual.
- *Air Permits Specialist.* Each ES&H Team is supported by an air permits specialist who is a member of the Terrestrial, Atmospheric, Monitoring, and Modeling (TAMM) Group of ORAD. Air permits specialists obtain permits and exemptions for authorizing organization equipment and processes and maintain copies of permit records issued by BAAQMD and SJVUAPCD. They coordinate any related agency contact or inspections of permitted equipment and processes with the authorizing organizations and provide a response to any Notice of Violation (NOV) or Request for Information. They also prepare special reports regarding air emissions that are required by various agencies.
- *Authorizing organizations.* LLNL authorizing organizations shall identify potential sources of air emissions with assistance from EPD. The authorizing organizations shall implement emission-control strategies to comply with air quality regulations and ensure compliance with applicable air permits, including required recordkeeping. When a potential air emission source is identified, the Responsible Individual from the authorizing organization shall consult with the assigned air



permits specialist to determine whether a permit is required. Consultation may also be initiated through the IWS process. Similarly, the Responsible Individual from the authorizing organization shall contact the ES&H Team environmental analyst whenever a new or potential source of air emission is identified, or when assistance is required in locating or identifying potential sources of air emissions. If in the process of reviewing and authorizing an activity you believe, as a result of your activity, that you may have a new or modified air emission source, contact the environmental analyst of your ES&H Team. LLNL authorizing organizations may appoint an individual who is responsible for contacting the air permits specialist and environmental analyst. However, the Responsible Individual/principal investigator of an experiment or owner of equipment that is a potential source of air emission has ultimate responsibility for ensuring that personnel from EPD are notified.

## **4.0 Air Emission Source Evaluation**

### **4.1 Which Air Emission Sources Require a Permit?**

Both BAAQMD and SJVUAPCD rules and regulations require any person planning to build, erect, alter, replace, operate, or use any article, machine, equipment, or other contrivance that might cause the release of air contaminants to **first** obtain an air permit from their air district. The air permits specialist obtains the permit through a three-part process: (1) Application for Authority to Construct (2) Notification of Startup, and (3) Permit to Operate.

Table 1 lists examples of air emission sources at LLNL that are subject to regulation by the air districts.

### **4.2 How to Begin the Permit Process**

LLNL authorizing organization personnel work closely with the air permits specialist to evaluate sources potentially requiring a Permit to Operate (or a letter of exemption, discussed below). Responsible Individuals should remember that new emission sources generally require National Environmental Policy Act (NEPA) documentation as well. Consult your ES&H Team environmental analyst to determine NEPA and permitting requirements. The Responsible Individual (principal investigator, owner of equipment, project leader, or an individual designated by the authorizing organization) is responsible for contacting the air permits specialist and the ES&H Team environmental analyst.

**Table 1. Examples of air emission sources and chemicals that may require an air permit.**

Abrasive blasting (sand, steel, shotblast)	Liquefied petroleum gas, propane
Acids	Materials crushing
Adhesives	Metal heat treating
Aeration of contaminated soils	Metal shops (cyclone exhaust)
Alcohols	Natural gas
Automotive repair (solvent cleaning/brake shoe bonding)	Open burning
Boilers (oil and natural gas fired)	Organic chemical storage (large containers/tanks)
Casting/molding	Organic dyes/pigments
Ceramics (drying/grinding)	Organic solvent evaporation (degreasing/metal cleaning)
Chemicals	Paints
Cleaning chemicals	Petroleum storage tanks
Coating ovens	Photographic equipment (resins/toners)
Cold cleaners (stripping/washing)	Plastics formulation
Cooling towers (blowdown)	Pressure tanks (gas cylinders)
Crushing/screening	Printing and publishing (inks/solvents/adhesives)
Degreasers (open top/conveyor/portable)	Sand/gravel (transferring/conveying/hauling)
Distillate oil (diesel oil, No. 2)	Sanders (cyclone exhaust)
Electroplating (rinsing/finishing)	Semiconductor operation
Emergency generators	Solid-waste disposal (storage/fugitive emissions)
Explosives (burning/detonation)	Specialty cleaners
Fluorocarbons/CFCs	Steam generators (steam cleaning)
Fugitive emissions	Surface coating (primer/varnish/lacquer)
Gasoline dispensing operations (auto/truck/tanks)	Thinning solvents
General processes (storage/transfer/distillation)	Waste gas flares
Grinders	Wastewater (oil-water) separator
Ground water/soil vapor extraction	Woodshops (sawing/cyclone exhaust)
Health Services Department (laboratory chemicals)	

To determine if a source needs a permit, provide your air permits specialist with answers to the following questions:

1. What chemicals are being used? Include the composition of paints, coatings, and adhesives, as well as material safety data sheets (MSDS).
2. What quantities of chemicals are being used?
3. What is the type of operation or equipment (painting, solvent cleaner, boiler, fume hood, etc.)?
4. What are the release points (stack height, diameter, flow rate, and location)?

5. What is the maximum frequency of emissions? For example, is it a one-time puff, continuous, 4 hours per day, or 2 to 5 days per month?
6. Is there abatement equipment [high-efficiency particulate abatement (HEPA), scrubber, baghouse, etc.]?
7. What is the efficiency of the abatement equipment?
8. Describe the equipment. Include a manufacturer's catalog description or an engineer's drawing, etc.
9. Describe the project. What does it do? Does it produce any waste? Is there a flow diagram of the process?
10. When will the equipment be installed?
11. Does the equipment create air emissions that require emission credits (offsets)?  
Your air permits specialist will assist you in obtaining this information.

Your air permits specialist will not only evaluate your air emission source for permit requirements, but also advise you of potential operating restrictions that may apply.

#### **4.3 Abatement Devices**

Abatement devices keep some air emissions within allowable limits. Examples of such devices include baghouses (to capture dust), cyclones (to capture particulates), absorbers (to capture some liquid and gaseous substances), and absorbers (to capture other gaseous materials). In general, abatement devices can reduce emissions by 70 to 99%. Abatement devices are included in the air districts' regulations to control the quality of such equipment. An abatement device itself may also require a Permit to Operate.

## **5.0 The Permit and Exemption Process**

### **5.1 How Is an Air Permit Issued?**

When information describing a potential air emission source is submitted to your air permits specialist, that individual will complete the appropriate documents. All documents are reviewed by a authorizing organization-designated representative, LLNL's Legal Department, and the TMM group leader. The documents are then sent to an air district engineer, who determines the completeness of the permit application and issues an Authority to Construct as the first stage in issuing an air permit. The Authority to Construct is required for new sources and is valid for two years.

An LLNL authorizing organization shall not purchase equipment that may emit air pollutants until LLNL has received an Authority to Construct for the equipment. If the air district does not approve the equipment, it cannot be legally operated.

After the Authority to Construct is received, construction may begin. When the equipment is ready for operation, the air permits specialist sends the air district a startup notification. If the equipment is found to be as described in the permit application and meets the permit conditions, a Permit to Operate is issued, and operations may begin. The BAAQMD permits are valid for one year; SJVUAPCD permits are valid for five years and are paid annually. Permits may be rescinded at any time for a violation of regulations or permit conditions.

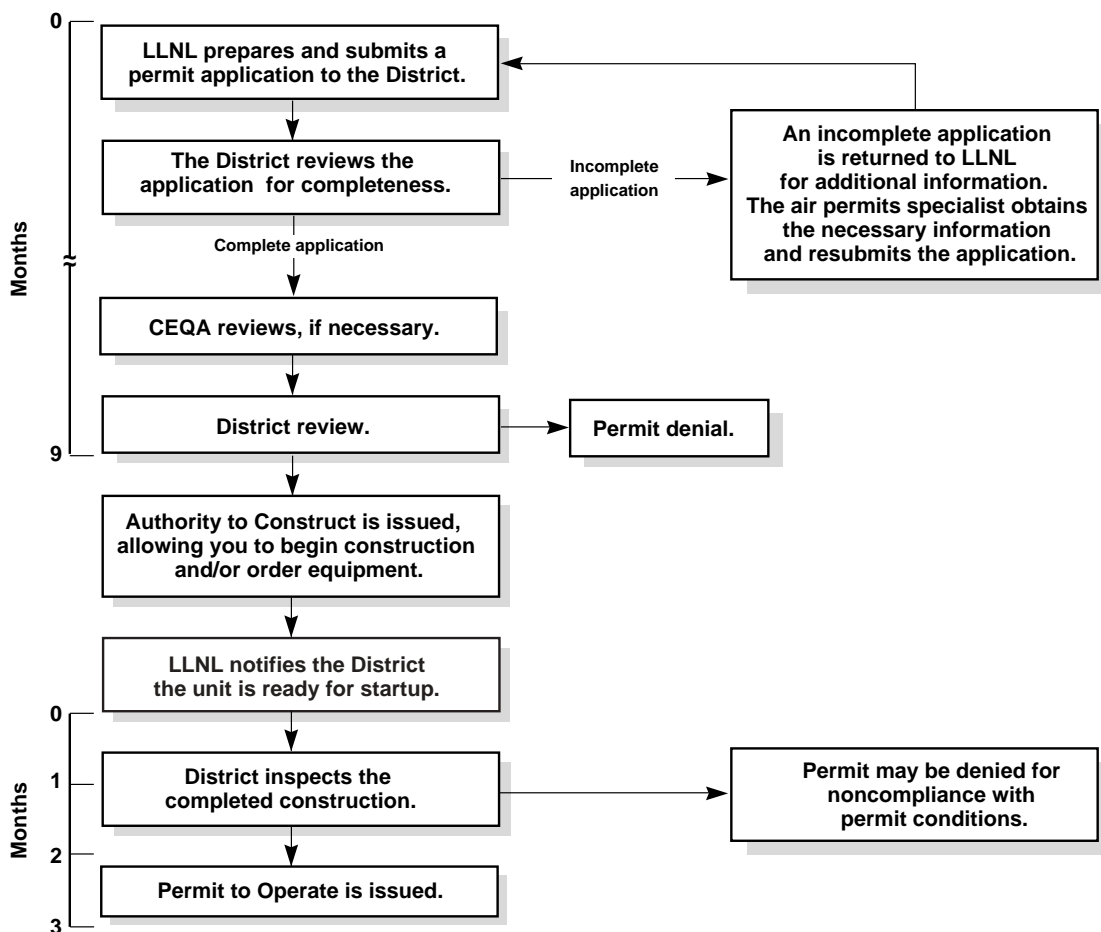
## **5.2 How Much Time Will It Take To Obtain a Permit?**

A new Permit to Operate can take anywhere from 3 months to 2 years or longer, depending on the complexity of the equipment or process involved. A typical air permit can take from 6 to 9 months for review by the district staff for completeness, payment of fees, issuance of an Authority to Construct, source testing, final inspection by the air district, and issuance of a Permit to Operate. It is important to note that should additional information be required by the air district after the permit application has been submitted, the timelines are restarted from the beginning. Therefore, it is important to submit a complete application with necessary information in order to streamline and expedite the permitting process.

Air emission sources requiring a permit are reviewed pursuant to requirements of the California Environmental Quality Act. The review can add an additional 6 to 12 months to the permit process. More delays can occur when offset credits are necessary. Figure 1 shows a time line that illustrates air permit activity.

## **5.3 Operating Restrictions after a Permit Is Obtained**

Each LLNL authorizing organization is required to have the Authority to Construct, Permit to Operate, or justification for an exemption available for inspection by the air district inspector. EPD prepares any required documentation. Operation of equipment is required to be consistent with the specific conditions outlined in these documents and in any other applicable regulations identified by your air permits specialist. If a source operates in violation of an air district regulation or permit condition, it shall be shut down and not restarted until corrective action has been completed.



**Figure 1. Timeline for average permit issuance.**

The permit or exemption document may include specific conditions that limit the operation. For example, the document may require that detailed records of data related to air emissions, such as solvent usage, be maintained. The records might show the number of gallons of solvents that are evaporated or otherwise lost to the atmosphere. The air district inspector uses the logs to determine whether LLNL is in compliance with permit conditions and district regulations. The inspector may interpret missing data as a violation. Your air permits specialist or environmental analyst will provide guidance on creating and maintaining a log book that meets requirements.

#### 5.4 Permit Renewal Process

The BAAQMD and the SJVUAPCD send permit renewal forms to ORAD annually. If there is no change in operation or applicable regulations, and the authorizing organization representative provides annual usage of permitted materials, and verifies that the information related to the permit is current, your air permits specialist can renew the permit automatically through payment of annual fees. Permit renewals occur

every year in March for the BAAQMD and every five years in January for the SJVUAPCD. Renewed permits are mailed to the authorizing organization representative of each operation. In the event that the air district does not process the permit renewal prior to the expiration date, the districts advise LLNL that the expired permit will remain valid until the renewal process is complete. Inspectors do not issue a Notice of Violation in such instances.

## 5.5 Permit Exemption

Table 2 lists general classes of sources that may be exempt from permitting by the BAAQMD. Such operations shall be reviewed by your air permits specialist prior to implementation. If a source operates under an exemption, it is still required to comply with all prohibitory regulations.

**Table 2. Classes of sources that may be exempt from permitting by the BAAQMD.**

Class	Examples
General combustion equipment	Sources with <1 million BTU/hr capacity
Internal combustion equipment	Gas turbines with <250-hp output rating; engines used solely as standby power and operated <30 days/year or only used for power when normal power lines fail
Furnaces, ovens, and kilns	Enameling furnaces; equipment used for diffusion treating of metals; covers used for curing of plastics that are in a vacuum mold
Surface preparation and cleaning equipment	Surface cleaning using <1% volatile organic compound (VOC) (wt) cleaners; abrasive blast cabinets; cold solvent cleaners of <1 sq ft surface area or using <1 gal of solvent
Surface coating	Any powder coating operation; printing presses using <150 lb/year of ink that have <1% printing VOCs and consume <20 gal/yr; use of coatings that contain <1% VOC (wt); coating operations using only hand-held, nonrefillable aerosol cans
Material working and handling equipment	Equipment for buffing, carving, machining of ceramic precision parts, metals, plastics, etc.; equipment used exclusively for sintering of glass or metals
Casting and molding equipment	Molds for metal casting; equipment for compression molding and injection molding of plastics
Liquid storage and loading equipment	Storage tanks and vessels with <260-gal capacity; tanks, vessels, and pumping equipment used to store or dispense aqueous solutions with 1% by wt organic compounds; containers for liquefied gases, lubricating oils, and certain fuel oils
Semiconductor manufacturing	Areas that contain only the following equipment: ion implantation, lapping and polishing, sputtering, vacuum deposition, plasma etching; wet chemical solvent or acid cleaning stations with <100-gal capacity per fabrication area; buffing, polishing, etc., of semiconductor wafers

**Table 2. Classes of sources that may be exempt from permitting by the BAAQMD. (cont.)**

Class	Examples
Printed circuit board manufacturing equipment	Equipment used exclusively for plating, buffing, polishing, turning, etc., of printed circuit boards
Testing equipment	Laboratory equipment used exclusively for chemical or physical analyses and bench-scale laboratory equipment; equipment used for inspecting metal products
Chemical processing	Containers, reservoirs, or tanks used exclusively for electrolytic plating, polishing, or stripping of brass, bronze, cadmium, copper, iron, nickel, tin, zinc, and precious metals
Miscellaneous	Comfort air conditioning systems; natural draft hoods; equipment used to liquefy or separate oxygen, nitrogen, or rare gases from air; brazing, soldering, or welding equipment

## 6.0 Special Emission Programs

### 6.1 National Emission Standards for Hazardous Air Pollutants (NESHAPS)

Toxic air contaminants are regulated at both the federal and state levels. At the federal level, they are regulated by the NESHAPS, established under Section 112 of the Clean Air Act. The EPA has established health-based emissions standards for some hazardous air pollutants, including inorganic arsenic, beryllium, mercury, asbestos, radionuclides, vinyl chloride, benzene, and coke oven gas. Except for radionuclides, the EPA has delegated enforcement of these standards to California. Your environmental analyst will help you determine appropriate controls if your activity involves contaminants required by NESHAPS.

### 6.2 AB 2588

In September 1987, then California Governor George Deukmejian signed into law AB 2588, the Air Toxics "Hot Spots" Information and Assessment Act. Under AB 2588, facilities are required to report the types and quantities of certain substances their facilities routinely release into the air. The goals of the AB 2588 program are to identify facilities that create air toxic hot spots, to collect emission data from those facilities, to ascertain health risks, and to notify nearby residents of significant risks.

LLNL completed the initial AB 2588 documentation in 1990 (for toxic emissions released in 1989) and submitted the documents to the BAAQMD and SJVUAPCD, respectively. LLNL was ranked by the districts in a low category of risk. AB 2588 also requires a facility inventory review and submittal of updated toxics emissions data on a periodic basis.

AB 2588 Toxic Hot Spots reporting is the mechanism by which the air district determines the cumulative impacts of toxic air contaminants from facilities. Because toxics (which are listed in the regulation) are a major concern, authorizing organization representatives shall report any significant changes in emissions of toxics to the air permits specialist so that the hot spots report can be modified accordingly.

### **6.3 Health Risk Screening**

California independently regulates sources of toxic air contaminants through the local air district permitting process. This is a separate regulatory process with regard to toxic air contaminants. The review involves a health risk screening to be conducted when the emissions of identified pollutants exceed a threshold for that pollutant. Contact your air permits specialist, who will work with you to obtain the necessary additional information that a health risk screening requires. The lists of compounds requiring health risk screening differ between the BAAQMD and the SJVUAPCD, and they are subject to periodic changes.

### **6.4 Enforcement Programs**

Air districts can initiate an enforcement action when permit conditions or district regulations are violated. Information regarding violations is obtained from citizen complaints, reports from facility employees, and routine inspections by district staff.

### **6.5 What Does an Inspector Look For?**

District inspectors routinely visit LLNL to inspect permitted equipment. Inspections are coordinated by EPD. Your ES&H Team environmental analyst will notify authorizing organization personnel if an air permit source is scheduled to be inspected. Inspections have several purposes. The inspectors ensure that permitted sources match the description in the air district's records and that additional equipment has not been installed without a permit. The equipment and its associated abatement devices are required to be in good working condition. Permit documents are required to be on hand, and the special requirements and conditions, including logbooks, are required to be verified. Inspectors carefully scrutinize every operation.

### **6.6 What Happens if the Inspector Finds a Violation?**

If an inspector finds a violation, an NOV can be issued. The inspector will ask the responsible authorizing organization representative to sign the bottom of the NOV. The recipient of the NOV has 10 calendar days to provide a written response to the air district describing actions taken to correct the situation. Your air permits specialist will



provide this response with the assistance of the authorizing organization and environmental analyst. All NOV's require that an Occurrence Report be submitted to DOE by the responsible authorizing organization.

The BAAQMD and SJVUAPCD can revoke permits if their terms and conditions are not followed. Violations can result in civil or criminal actions against LLNL or an operator. In a case of extreme and continuing violations, an air district could shut down a process and possibly a facility.

All information regarding violations is public information after the case is settled. Both the BAAQMD and the SJVUAPCD are required to send settlement information to CARB, which reports it to the EPA. Both districts publish lists or reports of settlements quarterly, which are available to the public.

## **7.0 Who To Contact**

Air regulations and policies affect many operations at LLNL. At times, obtaining the necessary documentation for an operation can be complicated and time consuming. It is the objective of TAMM and the air permits specialists to assist authorizing organizations in obtaining all necessary air permits with minimal disruption to operations. For assistance in locating or identifying potential sources of air emissions and with understanding regulatory requirements, contact your environmental analyst. If you have questions pertaining to air permits, contact your air permits specialist. If you are unsure who that is, call your ES&H Team for assistance.

## **8.0 Work Standards**

17 CCR §§ 60030–60053, Administrative Procedures (Permitting Requirements)  
17 CCR §§ 80100–80175, Agricultural Burning Guidelines  
17 CCR §§ 90700–90702, Air Toxics (Hot Spots) Fee Regulation  
17 CCR §§ 91100–91220, Determination of Emission  
17 CCR §§ 92000–92540, Abrasive blasting  
17 CCR §§ 93000–93110, Air Resources Board (Control of Toxic Air Contaminants)  
17 CCR §§ 93300–93355 and appendices, Emission Inventory Criteria and Guidelines  
17 CCR §§ 94100–94161, Compliance with Nonvehicular Emissions Standards  
40 CFR 60, Standards of Performance for New Stationary Sources  
40 CFR 61, National Emission Standards for Hazardous Air Pollutants

40 CFR 63, National Emissions Standards for Hazardous Air Pollutants for Source Categories

40 CFR 82, Protection of Stratospheric Ozone

42 USC § 7401 et seq., Clean Air Act (CAA)

42 USC § 7671 et seq., Clean Air Act amendments of 1990

Bay Area Air Quality Management District (BAAQMD) Regulations 1–12, Regulations and permitting requirements

CA Health and Safety Code §§ 40825–40843, Hearing Boards, Procedures

CA Health and Safety Code §§ 40918–40925.5, District Plans to Attain State Ambient Air Quality Standards

CA Health and Safety Code §§ 41700–41704, Emission Limitations, General Limitations

CA Health and Safety Code §§ 41750–41755, Emission Limitations, Portable Equipment

CA Health and Safety Code §§ 41800–41804, Non-agricultural Burning Requirements

CA Health and Safety Code § 41950, Gasoline Vapor Control

CA Health and Safety Code §§ 42300–42314.1, Enforcement, Permits

CA Health and Safety Code §§ 44300–44346, Air Toxics "Hot Spots" Information and Assessment

CA Health and Safety Code §§ 44360–44384, Air Toxics "Hot Spots" Information and Assessment, Risk Assessment, Fees and Regulations

San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) Rule 1100, Equipment Breakdown

San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) Rules 1010–9120, Regulations and permitting requirements

## Appendix A

### Glossary

Air contaminant or air pollutant	Any material that, when emitted, causes or tends to cause the degradation of air quality. Such material includes, but is not limited to, smoke, charred paper, dust, soot, grime, carbon, fumes, gases, odors, particulate matter, acids, or any combination thereof.
Air pollution	The presence of man-made gases and suspended particles in the atmosphere in excess of Air Quality Standards.
Air Quality Management District	Local agency, on a regional level, responsible for controlling pollutants discharged into the atmosphere from stationary sources.
Air Quality Standard	The prescribed level of a pollutant in the outside air that cannot be exceeded during a specific time in a specified geographical area. Established by both federal and state governments.
Air Resources Board	The agency in California responsible for air pollution control.
Ambient air	Any portion of the atmosphere not confined by four walls and a roof; outside air.
Atmosphere	The air that surrounds the earth, excluding the general volume of gases contained within a building or structure.
Authority to Construct	A preconstruction permit issued by an air district.
BAAQMD	The Bay Area Air Quality Management District, which governs LLNL's main site. the BAAQMD is a regional district, including all seven Bay Area counties (Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara) and the southern halves of Solano and Sonoma counties.
Baghouse	An air pollution abatement device that traps particulate (dust) by forcing gas streams through large bags usually made of glass fibers.

CARB	California Air Resources Board.
Cyclone	An air pollution abatement device that removes heavy particles by centrifugal force.
Environment	The aggregate of all external conditions and influences affecting the life, development, and ultimately the survival of an organism.
Fluorocarbon	An organic compound that contains fluorine. Some of these compounds may affect health, but they do not produce smog.
HEPA	A high-efficiency particulate abatement device.
NAAQS	National Ambient Air Quality Standards.
Nitrogen Oxides (NO <sub>x</sub> )	Product of combustion and a major contributor to acid deposition and the formation of ground level ozone. A criteria pollutant.
Nonprecursor Organic Compound (NPOC)	<p>The following are considered nonprecursor organic compounds: methylene chloride, 1,1,1-trichloroethane, 1,1,2-trichlorotrifluoroethane (CFC-113), trichloro-fluoromethane (CFC-11), dichlorodifluoro-methane (CFC-12), dichlorotetrafluoroethane (CFC-114), chloro-difluoromethane (CFC-22), chloropentafluoroethane (CFC-115), 2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124), pentafluoroethane (HFC-125), 1,1,2,2-tetrafluoro-ethane (HFC-134), 1,1,1-trifluoroethane (HFC-143a), 1,1-difluoroethane (HFC-152a), trifluoromethane (CFC-23) and perfluorocarbons that fall into these classes:</p> <ol style="list-style-type: none"><li>1) Cyclic, branched or linear, completely fluorinated alkanes,</li><li>2) Cyclic, branched or linear, completely fluorinated ethers with no unsaturations,</li><li>3) Cyclic, branched or linear, completely fluorinated tertiary amines with no unsaturations, and</li><li>4) Sulfur containing perfluorocarbons with no unsaturations and with sulfur bonds only to carbon and fluorine.</li></ol>

Notice of Violation (NOV)	A notice to a source owner of an apparent violation of air district regulations.
Organic compounds	Chemical compounds that contain carbon.
Ozone (O <sub>3</sub> )	A criteria pollutant in ambient air. In the stratosphere, it is an essential covering of protection to the earth from ultraviolet radiation.
Particulate matter	Particles of solid or liquid matter less than 10 microns in diameter, such as soot, dust, aerosols, fumes, and mists. A criteria pollutant.
Permit to Operate	An operational permit issued yearly by the BAAQMD and every five years by SJVUAPCD.
Precursor Organic Compound (POC)	Any compound of carbon except the nonprecursor organic compounds.
SIP	State Implementation Plan.
SJVUAPCD	San Joaquin Valley Unified Air Pollution Control District, which governs LLNL's Site 300.
Source	Any operation that produces and/or emits air pollutants.
Sulfur dioxide (SO <sub>2</sub> )	A product of natural gas and diesel fuel combustion. A criteria pollutant.
United States Environmental Protection Agency (EPA)	The federal agency that develops and enforces environmental regulations, including those pertaining to air quality.
Volatile Organic Compound (VOC)	Any compound of carbon, excluding methane, carbon monoxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which could be emitted during use, processing, application, curing, or drying of a solvent, surface coating, or other material.